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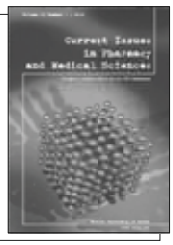

Assessment of using additional means of oral hygiene on the state of the hard tissue of teeth in 12-13 year old children living in the Lublin province

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ABSTRACT

The impact of additional means of oral hygiene (rinses, dental floss, dental irrigators, toothpicks) on the state of the hard tissue of teeth was assessed in 12-13 year old children living in the Lublin province. In order to accomplish this, clinical trials were conducted on 262 school-students aged 12-13 years from the Lublin macro-region. The study was conducted in randomly chosen primary schools, using standard clinical studies and surveys. The average number of DMFS, including its individual components D,M,F was determined. In addition, the authors also determined the OHIS index and DIS and CIS. Statistical analysis showed significant differences in the Oral Health Information Suite index (OHIS) between people who took additional measures in keeping oral hygiene, in comparison to those who did not (p=0.04). However, there were no statistically significant differences in the number of DMFS (including its individual components D,M,F), DIS, CIS and CPITN in children who declared using additional means of oral hygiene, as opposed to their peers who only brushed their teeth. The conducted studies showed the significant impact of using additional means of oral hygiene on the amount of plaque (OHIS index) among children.

Keywords: Additional means of oral hygiene, children, dental caries

INTRODUCTION

Lack of proper oral hygiene has an essential impact on the development of dental caries and periodontitis, both in permanent dentition and in deciduous teeth. Hygiene habits acquired during childhood, without doubt, affect the behavior of people in their adulthood. Oral hygiene consisting of only brushing teeth, and that broadened by using additional measures (mouthwashes, toothpicks, dental irrigators) during school years, to a large extent, translates towards the state of the hard tissue in later life.

The hardest tissue in the human body is the enamel. Its thickest layer lays within the cups and incisal ridges, and the thinnest, in the tooth cervix and the tooth furrows. It is these areas that are most vulnerable to plague accumulation, and as a result, to the formation of cavities. The development of these is the most common disease of the masticatory system [4].

Extreme importance in dental prophylaxis is attributed to the use of fluoride treatments. Fluorine [F] used in doses considered optimal, has, without doubt, an essential impact on the appearance of dental caries. This chemical element can be found not only in toothpastes, but is also a component of many other measures of oral hygiene (e.g. mouthwashes, dental floss) and in a number of nutrients (fish, sea food, tea). Consuming foods which are a rich source of fluoride increases the daily intake of this chemical element. [1, 2]. However, it is important to remember that fluoride in doses exceeding the optimal amount may lead to both acute and chronic poisoning. In some parts of the world (including Poland) drinking water also contains fluoride. There is, however, a tendency to decrease the maximum concentration of fluoride in drinking water. In the thirties of the twentieth century it was observed that those inhabiting regions where the fluoride concentration was above 2 mg/liter, had macular enamel. A careful observation revealed that lowering the fluoride concentration by half decreases or even eliminates enamel irregularities, while maintaining its anti-caries properties. This should not be forgotten during everyday dental practice when recommending to patients, preparations containing this chemical element.

The biological function of fluoride is the subject of numerous controversies. Most probably, the human organism does not really need it. Some textbooks do not mention fluoride uptake among other bio-element supplements. On the other hand, according to many authors, fluoride is considered a micro-element necessary for the proper functioning of the body despite the fact that no diseases concerning its deficiency were detected, nor were there standards established for an appropriate concentration of fluoride in the blood [3].

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MATERIAL AND METHODS

Clinical studies were conducted on 262 students, aged 12–13, from the Lublin macro-region. The study was conducted in Lublin and in the vicinity of the Bogdanka Coal Mine, in the towns of Puchaczów and Nadrybie. The first group included 114 boys and 98 girls attending Lublin schools, the second group included 26 boys and 24 girls from the vicinity of Bogdanka. Both clinical and survey studies were conducted. The clinical studies were done in artificial light using a mirror, dental explorer and a periodontal probe (according to WHO 621 procedures). The results of the study were recorded on a test card, which was a modification of the WHO card. The average number of DMFS (including its individual components D,M,F) was determined. The state of the subjects' oral hygiene was determined by the Oral Health Information Suite index (OHIS). The following teeth were taken into consideration: 11, 31, 16, 26, 36, 46. In case of the absence of a given tooth, the adjacent tooth was assessed. The study was conducted via rinsing with erythrosine, which dyes the dental plaque bright red. In order to assess the state of the periodontium, the Community Periodontal Index (CPI) was used. The periodontium state was assessed in the following teeth: 11, 31, 16, 26, 36, 46. In case of the absence of a given tooth, the adjacent tooth was assessed.

A survey was also distributed among students. The questions focused on both the basic (brushing teeth), as well as the additional means (rinses, dental floss, irrigators) of oral hygiene practiced by the surveyed group. The results were analyzed using STATISTICA 8.0 (StatSoft Poland).

In addition, the concentration of fluoride in drinking water intakes taken in by the students was also determined. The State District Sanitary Inspectorate in Łęczna, in data derived from the years between 2006 and 2010, determined that the amount of fluoride in drinking water in the vicinity of the Bogdanka Coal Mine does not exceed 0.55 mg/l, while the value of fluoride in drinking water, in Lublin, determined by the State District Sanitary Inspectorate in Lublin, is lower and does not exceed 0.238mg/l.

RESULTS

The statistical analysis that was conducted shows that students from Lublin, more frequently used additional measures of oral hygiene than those from the Bogdanka vicinity (p=0.009). In the group of respondents from Lublin, 16.98% used dental floss, 18.87 % used rinses, 6.6% used toothpicks, while 57.55 % of the children assessed/surveyed did not use additional measures of oral hygiene. In the group of students from the Bogdanka vicinity, 80% did not use additional measures of oral hygiene, while 12% used toothpicks and 8% used dental floss (Table 1).

Statistical analysis shows the existence of significant differences in the value of Oral Health Information Suite index (OHIS) in students taking additional measures of oral hygiene, as opposed to those who do not (p=0.04), (Table 2).

Table 1. The use of additional measures of oral hygiene among the studied groups

Additional measures	Lublin		Bogdanka vicinity	
	n	%	n	%
Dental floss	36	16.98	4	8.00
Toothpicks	14	6.60	6	12.00
Rinses	40	18.87	0	0.00
None	122	57.55	40	80.00
Statistical analysis: Chi^2=16,41; p=0,0009*				

* statistically significant dependency

Table 2. Average OHIS rate, considering gender, age, place of residence, usage of additional measures of oral hygiene

Factor		Average	Standard deviation	Statistical analysis
Gender	boys	1.88	0.92	Z=2.69; p=0.007*
	girls	1.54	1.01	
Age	12 years	1.66	0.97	Z=-1.42; p=0.15
	13 years	1.90	0.98	
Place of residence	Lublin	1.73	0.98	Z=2.45; p=0.01
	Bogdanka vicinity	1.33	0.57	
Additional measured of oral hygiene	yes	1.54	0,82	Z=-2.78; p=0.04*
	no	1.87	1.06	

* statistically significant dependency

Our studies show that the average value of the D component equaled to 2.44, for M, was 0.03 and for F, 1.73. The DMF index amounted to 4.2. The obtained results are presented in Table 3.

Table 3. The number of D,M,F, and DMF in permanent teeth and their average

Index	Average	Standard deviation
D	2.44	2.31
M	0.03	0.17
F	1.73	1.88
DMF	4.20	2.41

Our studies show that the value of the debris index scores (DIS) in the whole group equaled, on average, 1.21 ± 0.72, while the calculus index scores (CIS) equaled 0.41 ± 0.51. The OHIS was 1.73 ± 0.98, the GI index was 0.63 ± 0.83, and the community periodontal index of treatment needs (CPITN) amounted to 0.47 ± 0.53 (Fig. 1).

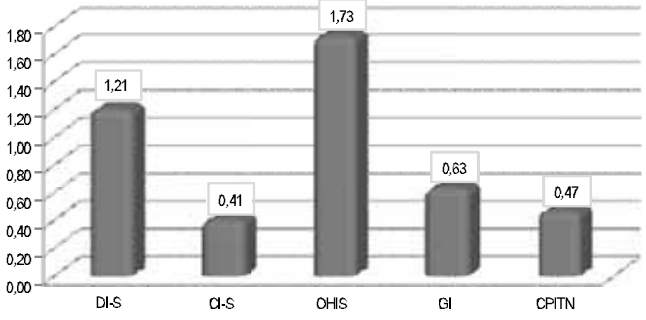

Fig. 1. Average DIS, CIS, GI, CPITN and OHIS in a given group

DISCUSSION

Statistical analysis of dental tests conducted on a group of 262 children aged 12–13 years, living in Lublin and in the vicinity of the Bogdanka Coal Mine helped to determine the state of the hard dental tissue in children living in different conditions and environments. The general state of health, including the state of the oral cavity, is closely connected with the social and the socio-economic status of the society. In a literary search, it was evident that many researchers believe that knowledge and pro-health attitudes are more frequent in students attending secondary schools than those attending vocational schools. However, it should be mentioned that the state of hygiene among all the tested groups that form the basis of our study is still unsatisfactory [5, 6, 7, 8]. This state of affairs frequently results from the lack of dental care and pro-health education of children and adolescents. Unfortunately, only approximately half of the surveyed students state that they visit their dentists at least once every six months [9, 10]. This is confirmed by the results of personal studies, although students from Lublin declare that they visit their dentist more frequently (every 4-6 months) than their peers living in Puchaczów and Nadrybie. This implies that the awareness of a proper oral hygiene is better among those with a higher educational level [6]. In addition, beyond the individual child, their parent's educational level and the family's living standard may significantly affect pro-health behaviors, including care and dental prophylaxis.

CONCLUSIONS

The conducted studies reveals that the state of oral hygiene in a majority of students in the Lublin area was dissatisfying. The lack of pro-health awareness and of a broadly understood dental prophylaxis using additional measures of oral hygiene, still leaves much to be desired. The results suggest a necessity for intensified prophylaxis and education of children and adolescence in the entire Lublin macro-region, particularly in the smaller towns.

REFERENCES

1. Longwell J.: The fluoridation of public water supplies: Chemical and technical aspects. *R. Soc. Health J.*, 361–370, 77, 1957.
2. Milsom K., Woodward M. et al.: Enamel Defects in the Deciduous Dentition as a Potential Predictor of Defects in the Permanent Dentition of 8- and 9-year-old Children in Fluoridated Cheshire. England. *J. Dent. Res.*, 1015–1018, 75 (4), 1996.
3. Pajdowski L.: *Chemia ogólna*. PWN, Warszawa 2002, 419–430.
4. Baryłko-Piekielna, N. and Drabent Z., *Zarys analizy sensorycznej żywności*. WNT, Warszawa 1975, 149-150.
5. Wysokińska-Miszczuk J., Walczak B. et al.: An analysis of the usefulness of brushing teeth according to the type of school, as well as their knowledge of oral hygiene. *Prz. Stom. Wieku Rozw.*, 21–24, 4/1, 1994/1995.
6. Bachanek T. and Fetkowska-Mielnik K.: The assessment of basic knowledge on oral hygiene in children treated for the nephrotic syndrome (nephrosis). C*zas. Stom.* 531–535, 44, 7–8, 1991.
7. Wochna-Sobańska M., Szatko F. et al.: Assessment of dental health and the dental health needs among 12 year old children from Łódź and the Piotrków Voivodeship. *Czas. Stom.*, 740–743, 46, 11–12, 1993.
8. Chłapowska J.: Dentition condition of selected group of children and youth and fluoride prophylaxis of dental caries. *Pozn. Stom.*, 113–115, 24, 1997.
9. Wędrychowicz-Welman A.: The level of knowledge of the basic principles of dental prevention among the pupils of one of the elementary schools in Poznań. *Pozn. Stom.*, 109–119, 27, 2000.
10. Szpringer-Nodzak M.: Stomatologia Wieku Rozwojowego. PZWL, Warszawa 1993, 729.